I. AMENDMENT

A. Claims

Please amend claim 114 as set forth below:

1. (original) A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect by using multiple projectors driven by a synthetic spectrum;

receiving a secondary wavelet produced by the nonlinear effect; and

processing the received secondary wavelet in identifying the object.

2. (original) The method of claim 1, wherein the step of identifying the object includes forming an image of the object.

3. (original) The method of claim 1, wherein the step of identifying the object includes identifying a material by comparing the received secondary wavelet with a standard.

4. (original) The method of claim 1, wherein the step of identifying the object includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from air.

5. (original) The method of claim 1, wherein the step of identifying the object includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from water.

6. (original) The method of claim 1, wherein the step of identifying the object

includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from land.

7. (original) The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as scattered acoustic energy.

8. (original) The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as backscattered acoustic energy.

9. (original) The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as oblique scattered acoustic energy.

10. (original) The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as forward scattered acoustic energy.

11. (original) The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet at more than one receiver, and wherein the step of processing the received secondary wavelet in identifying the object includes forming a tomographic image.

12. (original) The method of claim 11, wherein the step of forming a tomographic image includes forming a three dimensional tomographic image.

13. (original) The method of claim 1, wherein the step of directing includes passing the primary acoustic waveform through a wall of a container to reach the object.

14. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a beam width that does not increase before the receiving.

15. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a beam width that decreases before the receiving.

16. (original) The method of claim 1, wherein the step of identifying the object includes identifying a weapon.

17. (original) The method of claim 1, wherein the step of identifying the object includes identifying a radioactive substance.

18. (original) The method of claim 1, wherein the step of identifying the object includes identifying an explosive.

19. (original) The method of claim 1, wherein the step of identifying the object includes identifying a biological material.

20. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 10,000.

21. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 1,000.

22. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 100,000.

23. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 1 million.

24. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 10 million.

25. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 100 million.

26. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 1 billion.

27. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 10 billion.

28. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 10 billion.

29. (original) The method of claim 1, wherein the biological material has a concentration of less than one in 1 trillion.

30. (original) The method of claim 1, wherein the step of identifying the object

includes identifying a chemical.

31. (original) The method of claim 1, wherein the step of identifying the object includes identifying a drug.

32. (original) The method of claim 1, wherein the step of identifying the object includes identifying the object one of a plurality of objects prohibited by law.

33. (original) The method of claim 1, wherein the step of identifying the object includes identifying a land mine.

34. (original) The method of claim 1, wherein the step of identifying the object includes identifying an underwater mine.

35. (original) The method of claim 1, wherein the step of identifying the object includes identifying an archeological site.

36. (original) The method of claim 1, wherein the step of identifying the object includes identifying a pipe.

37. (original) The method of claim 1, wherein the step of identifying the object includes identifying an underground composition.

38. (original) The method of claim 1, wherein the step of identifying the object includes identifying an indicator of a composition.

39. (original) The method of claim 1, wherein the step of identifying the object includes identifying an indicator of a hydrocarbon.

40. (original) The method of claim 1, wherein the step of identifying a hydrocarbon.

41. (original) The method of claim 1, wherein the step of identifying the object includes forming a land seismographic stratification image.

42. (original) The method of claim 1, wherein the step of identifying the object includes forming a marine water stratification image.

43. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a container.

44. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a piece of luggage.

45. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a cargo container.

46. (original) The method of claim 1, wherein the step of directing the primary

acoustic waveform at the object includes directing the pulse at object concealed in a motor vehicle.

47. (original) The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle including a truck.

48. (original) The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle including an automobile.

49. (original) The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle other than a truck and other than a car.

50. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a water craft.

51. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in an aircraft.

52. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a nuclear reactor.

53. (original) The method of claim 1, wherein the step of directing the primary

acoustic waveform at the object includes directing the pulse at object concealed on a human.

54. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a human.

55. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a building.

56. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed underground.

57. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed under water.

58. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a metal container.

59. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a container having a thickness of at least ¼ of an inch.

60. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at object concealed in a container

having a thickness of at least 1/8 of an inch.

61. (original) The method of claim 1, further including the step of shaping the primary acoustic waveform into a Gausian envelope that is time differentiated with a direct current offset sufficient that none of the envelope is negative.

62. (original) The method of claim 61, further including the step of using the envelope to amplitude modulate a sinusoidal carrier wave.

63. (original) The method of claim 62, further including the step of gating the amplitude modulated sinusoidal carrier wave with a unitary pulse.

64. (original) The method of claim 61, further including the steps of:

standardizing the secondary wavelet of the primary wave form by the nonlinear acoustic effect that time differentiates the envelope in a projector's far field.

65. (original) The method of claim 64, wherein the step of processing includes discriminating a distortion of the secondary wavelet caused by the object.

66. (original) The method of claim 65, wherein the step of processing includes characterizing the distortion in the identifying of the object.

67. (original) The method of claim 1, wherein the step of processing includes separating elastic scattering and inelastic scattering.

68. (original) The method of claim 1, wherein the step of receiving the secondary wavelet is carried out with a wavelet having no recognizable carrier wave.

69. (original) The method of claim 1, wherein the step of receiving includes discerning the nonlinear effect as associated with the elastic scattering.

70. (original) The method of claim 69, wherein the step of discerning includes discerning a ratio of a nonlinear coefficient to a bulk modulus.

71. (original) The method of claim 69, wherein the step of discerning is carried out with the ratio being a ratio of a first order nonlinear coefficient to a bulk modulus, and wherein the step of discerning also includes discerning a second ratio of a second order nonlinear coefficient to the bulk modulus.

72. (original) The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to air.

73. (original) The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to water.

74. (original) The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to land.

75. (original) The method of claim 1, wherein the step of receiving includes discerning the nonlinear effect as associated with the inelastic scattering.

76. (original) The method of claim 75, further including the step of performing spectroscopic analysis of nonlinear responses excited by the secondary wavelet.

77. (original) The method of claim 1, wherein the step of identifying includes determining the object is present.

78. (original) The method of claim 1, wherein the step of identifying includes determining the object is not present.

79. (original) The method of claim 1, wherein the step of directing includes directing from a hover craft.

80. (original) The method of claim 1, wherein the step of directing includes directing from a drone.

81. (original) The method of claim 1, wherein the step of directing includes directing from a buoy.

82. (original) The method of claim 1, wherein the step of directing includes directing from a hand held device.

83. (original) The method of claim 1, wherein the step of directing includes directing from a toll booth device.

84. (original) The method of claim 1, wherein the step of directing includes directing from a passage-way device.

85. (original) The method of claim 1, wherein the step of directing includes directing from a vertical passage-way device.

86. (original) The method of claim 1, wherein the step of directing includes directing from a horizontal passage-way device.

87. (original) The method of claim 1, further including the step of moving a device directing the primary acoustic waveform, with respect to the object.

88. (original) The method of claim 1, further including the step of moving the object with respect to a device directing the primary acoustic waveform.

89. (original) The method of claim 1, further including the step of moving both the object and a device directing the primary acoustic waveform, and adjusting for relative movement.

90. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 40-80 KHz.

91. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 20-40 KHz.

92. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 25-30 KHz.

93. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 2-4KHz .

94. (original) The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 909-1,091Hz .

95. (original) The method of claim 1, wherein the step of directing is carried out with the secondary wavelet having a frequency in a range of 2.5-7.5 Hz.

96. (original) The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having a wavelength in a range of more than 0 to 40 kz.

97. (original) The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 0 to 20 kz.

98. (original) The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 0 to 2 kz.

99. (original) The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 91 to 273 Hz.

100. (original) The method of claim 1, wherein the step of processing includes

processing the received secondary wavelet to form pixels.

101. (original) The method of claim 1, wherein the step of processing includes processing the received secondary wavelet to form three-dimensional pixels.

102. (original) The method of claim 101, further including the step of identifying the object in each of a plurality of the pixels.

103. (original) The method of claim 1, further including the step of producing the primary acoustic wave form with a transducer that is not in contact with a container of the object.

104. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform is carried out with only one projector transmitting in a far field of the projector.

105. (original) The method of claim 1, wherein the step of directing the primary acoustic waveform is carried out with a plurality of projectors transmitting in a far field of an array formed by the projectors.

106. (original) The method of claim 1, wherein the step of directing is carried out with contiguous filters, each filter having a unique pass band and corresponding to a projector in an array.

107. (original) The method of claim 1, wherein the step of directing is carried out

with contiguous filters, each filter having a unique pass band and corresponding to a projector in an array, and further including the step of:

forming a focal region of coherent reconstruction of amplifying the primary acoustic waveform.

108. (original) The method of claim 107, wherein the step of receiving includes the step of equalizing an impedance mismatch caused by a wall to a container of the object.

109. (original) The method of claim 108, wherein the step of directing includes the step of equalizing the impedance mismatch.

110. (original) The method of claim 109, wherein the steps of directing and receiving include adapting feedback to carry the steps of equalizing.

111. (original) The method of claim 1, wherein the object is an element.

112. (original) The method of claim 1, wherein the object is a molecule.

113. (original) The method of claim 1, wherein the object is an isotope.

114. (Currently amended) A method of any one of claims 1-113, 116-117, further including the step of:

de-convoluting a spectrum of the primary waveform in overcoming an impedance discontinuity .

115. (original) A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect;

receiving a secondary wavelet produced by the nonlinear effect;

processing the received secondary wavelet in identifying the object; and

de-convoluting a spectrum of the primary waveform in overcoming an impedance discontinuity .

116. (Previously presented) A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect by using multiple projectors driven by a synthetic spectrum;

receiving one or more secondary wavelets produced by the nonlinear effect;

processing the one or more received secondary wavelets in identifying the object, the identifying including forming an image of the object, and identifying a material of the object; and

manipulating bandwidth of the wave form.

117. (Previously presented) A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect by using multiple projectors driven by a synthetic spectrum;

receiving one or more secondary wavelets produced by the nonlinear effect;

processing the one or more received secondary wavelets in identifying the

object, the identifying including forming an image of the object and identifying a material of the object;

manipulating bandwidth of the wave form; and wherein:

the object is at least one of a weapon, radioactive substance, explosive, biological material, chemical, drug, land mine, underwater mine, archeological site, pipe, underground composition, hydrocarbon, land seismographic stratification, marine water stratification, element, molecule, isotope, the identifying including determining whether the object is present or not present;

the directing includes directing at the object concealed in or on at least one of a container, piece of luggage, motor vehicle, watercraft, aircraft, nuclear reactor, human, or building, and the directing includes shaping the acoustic waveform into a Gaussian envelope, the directing including directing from at least one of a hovercraft, drone, buoy, hand-held device, toll booth, or passage-way device;

the directing is carried out with the primary acoustic wave form having a frequency range of within one of the ranges of 2-4KHz, 20-80 KHz, or 909-1,091 KHz, and the secondary at least one wavelet in the range of more than 0 to 40 Hz and wherein the bandwidth is within one of the ranges of more than 0-20 Kz or 91-273 Hz, the directing including producing the waveform with at least one of a transducer, a farfield projector, or contiguous filters;

the receiving includes discerning the non-linear effect as associated with elastic or inelastic scattering, discerning a ratio of a nonlinear coefficient to a bulk modulus, and comparing the secondary wavelet with a wavelet standardized to at least one of air, water, or land; and

the processing includes discriminating a distortion of the at least one secondary wavelet, characterizing the distortion, separating the elastic scattering and inelastic scattering, and processing to form pixels.